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United States Department of Agriculture
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INFORMATION ABOUT BEEKEEPING

This circular brings up to date information in E-276 last issued by the former Bureau of Entomology and Plant Quarantine in 1953. It lists publications on beekeeping issued by the Department of Agriculture and its State cooperators, and also books and journals, bee supply houses, and beekeeping organizations. The beekeeping activities of the Department of Agriculture are outlined, and a few paragraphs giving advice to beginners are included.

If your beekeeping questions are not answered in this and other Department publications, the Entomology Research Branch will be glad to render further assistance. Address all inquiries to the Beekeeping and Insect Pathology Section, Agricultural Research Center, Beltsville, Md.

The honey bee is our only source of honey and beeswax. This insect produces more than 200 million pounds of honey and 4 million pounds of beeswax annually in the United States. However, these are merely by-products of honey bee activities. Their principal role is in the pollination of about 50 agricultural crops for the production of seed and fruit. Many other insects are of value as pollinators, but their numbers have been so depleted in the course of agricultural development that they can no longer be relied upon. Honey bees are now the most numerous flower-visiting insects in practically all agricultural areas. Transfer of pollen from flower to flower is so essential that beekeeping must be carried on to maintain a profitable agriculture.

Although keeping bees on a commercial scale requires that they be located in areas with an abundant acreage of honey plants, a person can keep a few colonies as a hobby, or to furnish honey for his table, or to increase the supply of pollinating insects in practically all cultivated areas of the country. Because they can be kept so universally, many persons own bees, but not enough keep bees efficiently or make beekeeping a specialty. Efficiency in beekeeping is based upon a thorough knowledge of the life and behavior of bees, the proper use of equipment, and careful attention to marketing problems.

UNITED STATES DEPARTMENT OF AGRICULTURE PUBLICATIONS

Some of the following publications are available for free distribution. All are obtainable by purchase from the Superintendent of Documents, Government Printing Office, Washington 25, D. C., or can be consulted in libraries. Do not send money or any other kind of remittance for publications to the Beekeeping and Insect Pathology Section.

Farmers' Bulletins:

	Cents
961, Transferring Bees to Modern Hives	5
2074, American Foulbrood of Honey Bees.....	10

Circulars:

386, The Wax Moth and Its Control	5
392, Diagnosing Bee Diseases in the Apiary.....	5
554, Honey and Pollen Plants in the United States	10
650, Factors Affecting Usefulness of Honey Bees in Pollination	10
702, Productive Management of Honey Bee Colonies in the Northern States	10
876, Use of Honey Bees in Alfalfa Seed Production.....	5

Technical Bulletins:

656, Cost of Producing Extracted Honey in California	10
716, Investigations of the Physical and Chemical Properties of Beeswax.....	5

The following publications of the former Bureau of Entomology and Plant Quarantine are obtainable without cost from the Beekeeping and Insect Pathology Section:

- E-297, List of Dealers in Beekeeping Supplies, Package Bees, and Queens.
- E-531, The Use of Pollen Traps and Pollen Supplements in Developing Honey Bee Colonies.
- E-536, The Role of Pollen in the Economy of the Hive.
- E-693, Two-Queen Colony Management.
- E-749, Bee-Gathered Pollen in Various Localities of the Pacific Coast.
- E-763, Tests with DDT on Honey Bees in Small Cages.
- ET-250, A Manual for the Artificial Insemination of Queen Bees.
- ET-291, Thresher and Separator for Red Clover Seed Samples.

FEDERAL-STATE COOPERATIVE PUBLICATIONS

The following State publications, reporting investigations in cooperation with the United States Department of Agriculture, can be obtained from the indicated State Agricultural Experiment Station or consulted in libraries:

- Nectar and Pollen Plants of Oregon, by H. A. Scullen and George H. Vansell. Oregon Agricultural Experiment Station, Bulletin 412, 1942.
- The Beginner Beekeeper in Louisiana, by E. Oertel. Louisiana State Department of Agriculture and Immigration. Ed. 2, 1947.
- Pollen and Nectar Plants of Utah, by George H. Vansell. Utah Agricultural Experiment Station, Circular 124. 1949.
- Growing Alfalfa for Seed in Utah, by G. E. Bohart, G. F. Knowlton, W. P. Nye, and F. E. Todd. (Contains section on pollinating insects.) Utah Agricultural Experiment Station, Circular 125. 1950.
- Feeding Pollen Supplement and Pollen Substitutes to Honey Bees, by M. Levin, W. Nye, G. Knowlton. Utah Agricultural Experiment Station, Bulletin 237. 1951.
- Honey Bees for Higher Yields of Alfalfa Seed in Utah, by G. E. Bohart, G. Knowlton. Utah Agricultural Experiment Station, Circular 154. 1951.

Other information available without cost from various agencies in the Department of Agriculture is indicated below:

Semimonthly Honey Reports. These reports give quotations on honey and beeswax, the condition of bees and honey plants, data on imports and exports of honey, and other pertinent information relating to the marketing of honey and beeswax. Fruit and Vegetable Division, Agricultural Marketing Service, Washington 25, D. C.

Production Statistics. Honey and Beeswax Production. This is an annual report, usually issued in January, which gives statistics on the number of colonies, and production of honey and beeswax. Crops Reporting Board, Agricultural Marketing Service, Washington 25, D. C.

United States Standards for Grades of Extracted Honey Effective April 15, 1951. Processed Products Standardization and Inspection Branch, Fruit and Vegetable Division, Agricultural Marketing Service, Washington 25, D. C.

Honey Diversion Program. Payments of 3 3/4 cents per pound were made on the 1954 honey crop sold by packers or dealers to manufacturers for use in approved new outlets. Fruit and Vegetable Division, Agricultural Marketing Service, Washington 25, D. C.

Honey Price Support Program. The Agricultural Act of 1949 makes honey price support for beekeepers mandatory at levels ranging from 60 to 90 percent of parity. The 1955 program provides for the support of most flavors of honey meeting U. S. Grade C specifications at an average of 9.9 cents per pound delivered in 60-pound or larger containers, through approved farm-storage or warehouse-storage loans or purchase agreements. Honey on which loans are not repaid will be taken over by CCC. Sugar Division, Commodity Stabilization Service, Washington 25, D. C.

Permanent Glass Color Standards for Extracted Honey, Circular 307, Bureau of Agricultural and Industrial Chemistry. Eastern Regional Utilization Laboratory, Philadelphia 18, Pa.

Honey-Marketing Cooperatives. Farmer Cooperative Service, Washington 25, D. C.

Motion Picture Film. "The Realm of the Honey Bee." This is a silent four-reel film showing the life history and behavior of the honey bee. It is replete with closeups of bees gathering nectar and pollen, performing the "food dance," and driving out drones and robber bees. It shows how bees sting, and also records a fatal encounter between rival queens. The film closes showing how honey is removed from the hives and prepared for market, and a few of the ways in which honey can be used. Copies of this film in 35-millimeter width may be purchased through the Motion Picture Service, Office of Information, U. S. Department of Agriculture, Washington 25, D. C. Copies of 16-millimeter width may be purchased from United World Film, Inc., 1445 Park Ave., New York 29, N. Y.

BEE SUPPLY HOUSES

C. W. Aeppler Co.	Oconomowoc, Wis.
Dadant and Sons	Hamilton, Ill.
Diamond Match Co.....	Chico, Calif.
Walter T. Kelley Co.....	Clarkson, Ky.
Leahy Manufacturing Co.....	Higginsville, Mo.
G. B. Lewis Co.....	Watertown, Wis.
August Lotz Co.....	Boyd, Wis.
Marshfield Mfg. Co., Inc.....	Marshfield, Wis.
Fred W. Muth Co.	Cincinnati, Ohio
A. I. Root Co.	Medina, Ohio

Williams Brothers Mfg. Co.....	Portland, Oreg.
A. G. Woodman Co.....	Grand Rapids, Mich.
Superior Honey Co.....	Ogden, Utah, and Los Angeles, Calif.
The Hubbard Apiaries	Onsted, Mich.

See also: List of Dealers in Beekeeping Supplies,
Package Bees, and Queens. U. S. Bur.
Ent. and Plant Quar. E-297

BEE JOURNALS

The following are issued monthly at about \$1 to \$2 per year:

American Bee Journal, Hamilton, Ill.
Gleanings in Bee Culture, Medina, Ohio
Modern Beekeeping, Clarkson, Ky.

BOOKS ON BEEKEEPING

Books for sale by bee supply houses (see pages 4 and 5) and book dealers. Prices are approximate. Some of these books may be in your public library.

ABC and XYZ of Bee Culture (1950). A.I. and E.R. Root.....	\$3.95
Allen Latham's Bee Book (1949). Allen Latham	2.95
American Honey Plants (1947). Frank C. Pellett.....	6.00
Anatomy and Physiology of the Honey Bee (1925). R.E. Snodgrass.	3.50
Backlot Beekeeping (1949). C. H. Pease	2.00
Bee Hives and Apron Strings (1952). Nola R. Hooper	2.50
Bee Hunter (1949). G. H. Edgell	2.50
Bee Hunting (1908). John R. Lockard50
Beekeeping (1928). E. F. Phillips	4.00
Beekeeping for Beginners (1949). G. H. Cale, Jr.....	1.00
Beekeeping as a Hobby (1941). Kyle Onstott	2.00
Bee Venom Therapy (1935). Bodog F. Beck	5.00
Bees Are My Business (1955). Harry J. Whitcombe.....	3.75
Bees, Vision, Chemical Senses, Language (1950). K. von Frisch ..	3.00
Beeswax (1951). H. H. Root	4.75
Behaviour and Social Life of Honeybees (1953). C.R. Ribbands....	4.50
Better Queens (1949). Jay Smith.....	4.00
City of the Bees (1949). Frank S. Stuart	3.00
Dadant System of Beekeeping (1932). C. P. Dadant.....	1.00
Dancing Bees (1954). K. von Krisch	2.25

First Lessons in Beekeeping (1951). C. P. Dadant.....	\$1.00
500 Answers to Bee Questions (1955). Walter Barth95
Following the Bee Line (1931). Josephine Morse	1.00
Golden Throng (1940). Edwin Way Teale	5.00
History of American Beekeeping (1938). Frank C. Pellett.....	2.50
Hive and the Honey Bee (1949). Roy A. Grout	4.00
Honey Bees and Their Management (1951). S. Whitehead and F. Shaw.....	3.50
Honey Getting (1948). E. L. Sechrist.....	1.00
Honey in the Comb (1951). Carl E. Killion	3.00
Honey and Your Health (1944). B. Beck and D. Smedley	3.00
Honey Plants of North America (1926). J. H. Lovell.....	1.50
How to Grow Queens (1938). Walter T. Kelley50
How to Keep Bees and Sell Honey (1955). Walter T. Kelley...	.75
How to Succeed with Bees (1930). Atkins and Hawkins.....	.55
Langstroth on the Hive and Honey Bee (1927). C. P. Dadant ..	2.00
Life of the Bee (1904). M. Maeterlinck	3.00
Living from Bees (1946). Frank C. Pellett	2.50
Practical Queen Rearing (1945). Frank C. Pellett	1.00
Productive Beekeeping (1923). Frank C. Pellett.....	3.00
Queen Rearing (1946). L. E. Snelgrove.....	5.00
Queen Rearing (1950). J. Eckert and H. Laidlaw	2.50
Starting Right with Bees (1952). H. G. Rowe.....	.75
World of the Honey Bee (1954). Colin G. Butler	4.50

ORGANIZATIONS IN THE BEEKEEPING INDUSTRY

American Bee Breeders Association--Garnett Puett, Jr.,
secretary, Hahira, Ga.

American Beekeeping Federation--Robert Banker, executive
secretary and treasurer, Cannon Falls, Minn. A national
organization comprised of State and county beekeepers'
organizations and individual beekeepers.

American Honey Institute--Mrs. Harriett M. Grace, director,
Commercial State Bank Building, Madison, Wis. An organiza-
tion sponsored and supported by bee-supply companies, bee-
keepers' organizations, and individuals. Its purpose is to give
publicity to honey through demonstrations, lectures, radio talks,
honey recipes, and other literature.

Apiary Inspectors of America--C. D. Floyd, secretary, University
Farm, St. Paul 1, Minn.

Bee Industries Association. R. H. Dadant, secretary, Hamilton,
Ill. Representing supply manufacturers.

Honey Bee Improvement Cooperative Association--Charles A. Reese,
secretary, Ohio State University, Columbus, Ohio. A nonprofit organ-
ization to promote the distribution of improved strains of the honey bee.

Honey Industry Council of America--Leslie Little, secretary, Shelbyville, Tenn. An organization of representatives of four organizations--the American Beekeeping Federation, Bee Industries Association, American Bee Breeders' Association, and the National Honey Packers and Dealers Association--representing the various segments of the industry banded together to correlate their activities on matters of mutual interest.

National Honey Packers and Dealers Association--Roland C. Stone, secretary, 5201 District Blvd., Los Angeles 22, Calif.

Southern States Beekeepers' Federation--W. A. Stephen, secretary, State College Station, Raleigh, N. C. An organization of honey producers, shippers of package bees, and queen breeders devoted to the interest of beekeeping in the Southern States.

State Beekeepers' Organizations--A beekeepers' association exists in practically every State. Information about such associations can usually be obtained through your State Department of Agriculture or your Agricultural College or Experiment Station.

BEEKEEPING AND POLLINATION RESEARCH LABORATORIES OF THE ENTOMOLOGY RESEARCH BRANCH

Work on beekeeping and insect pollination by the Entomology Research Branch is centered in the Beekeeping and Insect Pathology Section, Agricultural Research Center, Beltsville, Md. This Section carries on its beekeeping activities at laboratories in various parts of the country, as follows:

Arizona--Southwestern States Beekeeping Laboratory at Tucson. Frank E. Todd, in charge. Cooperating with the Arizona Agricultural Experiment Station.

Louisiana--Southern States Beekeeping Laboratory, University Station, Baton Rouge. Warren Whitcomb, Jr., in charge. Cooperating with the Louisiana Agricultural Experiment Station and the University of Louisiana.

Maryland--Headquarters of the Beekeeping and Insect Pathology Section, Agricultural Research Center, Beltsville. Jas. I. Hambleton, Section head, in charge. Assistant Section head, W. J. Nolan.

Utah--Legume Seed Research Laboratory at Logan. George E. Bohart is in charge of the insect-pollination phases. Cooperating with the Utah Agricultural College and Agricultural Experiment Station.

Wisconsin--North Central States Beekeeping Laboratory at Madison.

C. L. Farrar, in charge. Cooperating with the Wisconsin Agricultural Experiment Station and the University of Wisconsin.

Wyoming--Intermountain States Beekeeping Laboratory at Laramie.

A. P. Sturtevant, in charge. Cooperating with the Wyoming Agricultural Experiment Station and the University of Wyoming.

ADVICE TO BEGINNERS

Beekeeping is a specialized industry requiring fundamental knowledge of bee behavior and a genuine liking for handling bees. Locating colonies close to available sources of nectar is important, since to insure good crops the bees should be within flying range--that is, within 1 or 2 miles--of an abundance of nectar-secreting plants. Good beekeeping locations are found in practically every State, so that the selection of apiary sites resolves itself into choosing locations where nectar-secreting plants occur in profusion and where living conditions are desirable.

With proper experience and a liking for bees, a person in a favorable location can obtain from beekeeping a return that compares favorably with that from most agricultural pursuits. Beekeeping, however, can easily become a profitless undertaking, and to avoid this we advise beginners not to invest heavily. Practical knowledge gained through a season's work with an experienced beekeeper should be invaluable to a beginner. If you cannot spend time with a beekeeper, the next best thing is to acquire two or three colonies and do the best you can. A number of State educational institutions offer resident or correspondence courses in beekeeping.

A common method of starting a colony is to purchase a package of bees, preferably 3 pounds, with a queen and to install this package in a hive equipped with frames containing full sheets of brood foundation. Instructions for installing usually accompany the package.

If you purchase established colonies, they should be (1) in modern hives, (2) acquired from a reliable beekeeper, and (3) accompanied by a certificate of inspection to insure freedom from disease.

The best time to begin beekeeping with either package bees or established colonies is in the spring, when fruit trees are in bloom.

A beginner's outfit may consist of the following items, although it is suggested that catalogs from some of the bee supply houses be consulted for comparable information:

- 1 10-frame hive, consisting of--
 - 1 bottom board
 - 2 10-frame hive bodies complete with frames and brood foundation

- 2 to 4 shallow supers complete with frames and thin super foundation
- 1 outer cover and 1 inner cover
- 1 3-pound package of bees with queen
- 1 smoker
- 1 bee veil
- 1 hive tool
- 10-15 pounds of granulated sugar
- 4 ounces of No. 28-gage wire
- 1 spur imbedder

Such outfits, plus a subscription to a bee journal, cost approximately \$25 to \$30. The equipment can be varied, and more can be added after a person has become experienced and learns how to manage large colonies. The standard 10-frame hive is the type generally used in the United States.

While factory-made equipment ordinarily gives the most satisfactory results, some beekeepers prefer to construct their own beehives. If you do this, it is a good plan to purchase or borrow a complete hive to use as a model. It is essential that all dimensions be carefully adhered to; otherwise the bees will build combs and add propolis where it is not desired. Likewise careful construction is necessary so that all hive parts are readily interchangeable.

The Italian bee is the kind recommended for the beginner in this country. It is hardy, industrious, and fairly gentle, and can be readily obtained in pure stock since it is the bee most commonly kept in the United States.

Consult your Agricultural College, State Department of Agriculture, or Agricultural Experiment Station for information on State beekeeping publications, extension work in beekeeping, inspection service, good beekeeping locations, beekeeping associations, and the like.

CARDINAL POINTS TO OBSERVE IN KEEPING BEES

1. Bees need an abundant store of honey (25 or more pounds during the active season and 50 to 60 pounds in winter), pollen, plenty of room for brood rearing, a source of water, protection from the wind, and exposure to sunlight.

2. Swarming results in the loss of honey, and therefore should be controlled.

3. There should be empty comb space in the hives before and during a honey flow. When every cell becomes occupied with brood, pollen, or honey, the bees will swarm or stop working, in either case causing a loss of honey if just before or during a flow.

4. For successful wintering a colony should have a young queen of high producing stock, a large cluster of young fall-raised bees, 60 or more pounds of sealed honey, and several combs containing large areas of pollen. For these requirements a colony must have a 2-story standard hive with a gross weight, in October, of about 130 pounds.

5. It is unprofitable, and in many States illegal, to keep bees in box hives or "gums."

6. It does not pay to cultivate any plant for bees alone. Nectar resources may be improved, however, by planting such crops as sweet clover on waste lands.

7. Starvation is one of the principal causes of unprofitable beekeeping. If bees are short of honey stores, a sirup of 2 parts of clean granulated sugar to 1 of water should be fed. Plan carefully and avoid having to feed the bees by providing them with plenty of honey at all times.

8. Diseases of bees cause large annual losses of bees, honey, and equipment. Beekeepers should learn to recognize the symptoms, particularly of American foulbrood.

DISEASES OF BEES

Although it is normal to find a few dead bees at the entrance of a hive, the presence of large numbers should cause the beekeeper to examine the colony for some abnormal condition. The presence of trembling or paralyzed bees, or of bees crawling and apparently unable to fly, should arouse suspicion. Two of the commonest abnormal conditions of adult bees are poisoning by insecticides and Nosema disease. A laboratory diagnosis can be made for Nosema disease and insecticide poisoning, although at times a diagnosis of any abnormal condition of adult bees may require actual observation of the colony affected.

In many parts of the country beekeepers suffer losses from American or European foulbrood, the two most serious brood diseases. European foulbrood can be controlled by proper corrective measures, but American foulbrood, the more serious and prevalent of the two, requires a more drastic treatment. The bees and combs of colonies infected with American foulbrood should be burned.

Apiary inspection is a function of the States, and is maintained by most State Departments of Agriculture, to which should be referred all questions concerning apiary inspection, diagnoses, and proper methods of control. As a service to beekeepers, however, the Beekeeping and Insect Pathology Section examines, without cost, samples of brood and adult bees. Reports of these diagnoses are sent to the beekeepers and copies to the proper State apiary officials.

For diagnosing brood diseases, send to the Section at Beltsville a sample of comb about 4 by 4 inches containing the affected brood or brood remains. Avoid including any honey if possible. For diseases of adult worker bees, send from 100 to 200 (preferably the latter) sick or dead bees. Mail all samples in a wooden or heavy cardboard box. Do not use tin, glass, or waxed paper.

